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In the Claims:

1. (Currently Amended) A detector assembly comprising:
a collimator assembly comprising:
a first collimator segment having a first left end and a first right end, said first collimator segment comprising:
a plurality of first segment longitudinal walls having a first segment depth, each of said plurality of first segment longitudinal walls including a first interlocking protrusion comprising only a portion of said first segment depth, said plurality of first segment longitudinal walls configured to be planar to projected x-rays;
a second collimator segment having a second left end and a second right end, said second collimator segment comprising:
a plurality of second segment longitudinal walls having a second segment depth, each of said plurality of second segment longitudinal walls including a second interlocking protrusion comprising only a portion of said second segment depth, each of said second interlocking protrusions engaging one of said first interlocking protrusions to form a continuous sidewall segment; and
a plurality of first latitudinal segments positioned between each of said plurality of first longitudinal walls such that a plurality of first collimator chambers is formed, each of said first collimator chambers having a first collimator width.
2. (Original) A detector assembly as described in claim 1, wherein said first interlocking protrusion comprises a block shaped protrusion.
3. (Original) A detector assembly as described in claim 1, wherein said first interlocking protrusion comprises a triangular shaped protrusion.
4. (Original) A detector assembly as described in claim 1, wherein said plurality of first segment longitudinal walls comprise cast tungsten.
5. (Original) A detector assembly as described in claim 1, wherein said plurality of first segment longitudinal walls comprise cast lead.
6. (Cancelled)
7. (Currently Amended) A detector assembly as described in claim 1, wherein each of said first interlocking protrusions comprises a first protrusion width, said first protrusion width less than or equal to said first collimator width.

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8. (Original) A detector assembly as described in claim 1, wherein:
said first collimator segment comprises a first collimator height;
said first interlocking protrusion comprising a first protrusion height;
said second interlocking protrusion comprising a second protrusion height; and
said first protrusion height added to said second protrusion height equaling said first collimator height.

9. (Original) A detector assembly as described in claim 1, further comprising:

a scintillator assembly in communication with said collimator assembly, said scintillator assembly having a scintillator longitudinal width, said scintillator longitudinal width smaller than a collimator assembly longitudinal width.

10. (Original) A detector assembly as described in claim 1, wherein said first collimator segment further comprises:

a plurality of opposing interlocking protrusions each of which is formed on one of said a plurality of first segment longitudinal walls, each of said plurality of opposing interlocking protrusions positioned opposite one of said first interlocking protrusions, said opposing interlocking protrusion comprising only a portion of said first segment depth.

11. (Original) A detector assembly as described in claim 10, wherein each of said opposing interlocking protrusions creates a mirror negative to one of said first interlocking protrusions.

12. (Currently Amended) A detector assembly as described in claim 6, wherein said plurality of first collimator chambers forms a rectangular array.

13. (Currently Amended) A collimator assembly segment for mating to a second collimator segment comprising a plurality of second segment longitudinal walls having a second segment depth, each of the plurality of second segment longitudinal walls having a second interlocking protrusion having a second protrusion height comprising only a portion of the second segment depth, comprising:

a first collimator segment having a first left end and a first right end, said first collimator segment comprising:

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a plurality of first segment longitudinal walls having a first segment depth, each of said plurality of first segment longitudinal walls including a first interlocking protrusion comprising only a portion of said first segment depth, each of said first interlocking protrusions shaped to engage one of the second interlocking protrusions to form a continuous sidewall segment, said plurality of first segment longitudinal walls configured to be planar to projected x-rays; and

a plurality of first latitudinal segments positioned between each of said plurality of first longitudinal walls such that a plurality of first collimator chambers is formed, each of said first collimator chambers having a first collimator width.

14. (Original) A collimator assembly segment as described in claim 13, further comprising:

a plurality of first latitudinal segments positioned between each of said plurality of first longitudinal walls such that a plurality of first collimator chambers is formed, each of said first collimator chambers having a first collimator width.

15. (Original) A detector assembly as described in claim 14, wherein each of said first interlocking protrusions comprises a first protrusion width, said first protrusion width less than or equal to said first collimator width.

16. (Original) A detector assembly as described in claim 13, wherein:
said first collimator segment comprises a first collimator height;
said first interlocking protrusion comprising a first protrusion height;
said first protrusion height added to the second protrusion height equaling said first collimator height.

17. (Original) A detector assembly as described in claim 13, wherein said first collimator segment further comprises:

a plurality of opposing interlocking protrusions each of which is formed on one of said a plurality of first segment longitudinal walls, each of said plurality of opposing interlocking protrusions positioned opposite one of said first interlocking protrusions, said opposing interlocking protrusion comprising only a portion of said first segment depth.

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18. (Original) A detector assembly as described in claim 17, wherein each of said opposing interlocking protrusions creates a mirror negative to one of said first interlocking protrusions.

19. (Original) A method of manufacturing a detector assembly with extended longitudinal depth comprising:

casting a first collimator segment comprising a plurality of first segment longitudinal walls having a first segment depth, each of said plurality of first segment longitudinal walls including a first interlocking protrusion comprising only a portion of said first segment depth;

casting a second collimator segment comprising a plurality of second segment longitudinal walls having a second segment depth, each of said plurality of second segment longitudinal walls including a second interlocking protrusion comprising only a portion of said second segment depth;

engaging each of said second interlocking protrusions with one of said first interlocking protrusions to form a plurality of continuous sidewall segments.

20. (Currently Amended) A method of manufacturing a detector assembly, as described in claim 19 further comprising:

casting a plurality of first latitudinal segments between each of said plurality of first longitudinal walls such that a plurality of first collimator chambers is formed, each of said first collimator chambers having a first collimator width; and

casting said first interlocking protrusions and said second interlocking protrusions such that said first interlocking protrusions and said second interlocking protrusions combine to match said first segment depth~~each of said continuous sidewall segments equals said first collimator width.~~